

COLLECTING HYPOCHILUS

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Among the numerous species belonging to a definite order of invertebrate animals there are always a few which are difficult to classify. In the case of such forms as parasitic Crustacea the characters of the adult may become effaced, modified or even completely obliterated by parasitic life. In other cases structures characteristic of separate families may be present in the same species, making the assignment of the species to the one or the other family a matter of individual judgment. In such cases a more extensive study of the anatomy, embryology and mode of living may give real help in reaching a correct decision. The matter may be more complicated when the problem of phylogeny is drawn in and the question arises whether the structures under consideration are of ancestral type or of more recent acquisition. This is so in the case of *Hypochilus*, one of the most interesting spiders in the United States.

Hypochilus was discovered by Marx in 1888, who at once recognized its peculiar position. The specimens which he examined were collected by Dr. Fox in July of that year in the vicinity of Lookout Mountain, near Chattanooga, Tennessee. Marx noticed its resemblance to *Pholcus*, but the presence of four lungs, of a cribellum in front of the spinnerets and a calamistrum on the fourth metatarsi led him to the establishment of a new and distinct Family *Hypochilidæ* with a single species *Hypochilus thorelli*. An attempt to unite the family with Theraphosid spiders in a Sub-order *Tetrapneumones* has been revived by Dahl as recently as 1913, but the majority of the arachnologists place it at present with the true spiders in the Sub-order Arachnomorphæ. No new knowledge has been added concerning the spider since the time of Marx. Banks has recorded it from Paint Rock, Balsam and Sugar Fork of the Swannanoa River, in North Carolina. Comstock received specimens from Tallulah

Falls, Georgia, and published a photograph of a typical locality, made for him by Dr. Fox in the "Walden Ridge" without more definite reference to the geographical position. In 1888 Simon described a spider from southern China under the name of *Hypochilus davidi*, but in 1892 removed it to a new genus *Ectatosticta*. The interest in the status of the family was further enhanced by Simon, when in 1902 he described another species, *Ectatosticta australis*, from Tasmania. This species was later found to be synonymous with *Theridion troglodytes* Higg. et Pett. and is now listed as *Ectatosticta troglodytes*.

Thus in 1931 we find ourselves in the possession of very meager information concerning this peculiar family which comprises only three species from widely separated geographical regions, a family distinct from every other family of spiders, yet combining characters of two sub-orders, waiting for some one to make a more comprehensive study than the mere external description sufficient for identification of the species. It was long my desire to undertake such a study and this summer, owing to a grant from the Sigma Xi Society I was enabled to go South to collect the material. The results of the study will be published later in a special article on the subject.

I left New Haven on July 16th in company with Dr. G. E. Pickford who was collecting earthworms for her own studies, and proceeded to Mountain Lake in Virginia where we were joined by Professor and Mrs. Valentine, of Chapel Hill, N. C. We first visited White Top Mountain from the summit of which one gets an extensive view into Virginia, Tennessee and North Carolina. Although there are numerous rocks and ledges at different elevations on the mountain, no *Hypochilus* was found. The night was spent in a cabin near the summit and next morning we proceeded to Little Switzerland in North Carolina where we found comfortable lodgings in the charming Swiss Chalet. Careful search within a radius of about two miles did not disclose the presence of any *Hypochilus*, but *Cybaeus giganteus* Banks was common everywhere along the roads, on exposed rocks, clay banks, tree trunks, etc. We now took the road towards Asheville, N. C., and 22 miles from there for the first time struck a locality abounding in *Hypochili*. We first noticed the webs on ledges

situated a few dozen feet from the road by a little brook, over a dozen of them in fairly close proximity to each other. The webs, previously described by Marx and Comstock, are so characteristic and so different from webs of all other spiders, that they are easily detected without danger of confusion from an automobile moving at a moderate speed. While I was making photographs of the webs and ledges, Drs. Pickford and Valentine collected for me numerous specimens of various ages in a small ravine below the road. We did not attempt to collect between this locality and Highlands where we were due to arrive the same evening and where we actually arrived late after dark on account of tire trouble.

Highlands is situated in Macon County close to Georgia and South Carolina at an elevation of somewhat over 3,800 feet, and is surrounded by forests with deep gorges everywhere abounding in Hypochili. In fact, Hypochilus is here the second commonest spider, the only more common one being *Cybaeus giganteus*. Numerous webs were found near Linden Lake, on the trail to the Primeval Forest, on the road to Franklin, on the road to Cashiers and on the road to Dillard. The webs were especially abundant on ledges by the Cullasaja Falls, four miles from Highlands. We spent four delightful days in the company of Dr. Reinke, Director of the Sam T. Weyman Memorial Laboratory, and were deeply impressed by the potentialities of this locality for biological study. During that time we preserved many specimens of Hypochilus in fixing fluids for future microscopic study, others in alcohol for my collection and captured seventy living specimens which were put into individual aluminum containers for transportation to New Haven.

From Highlands we made a side trip to Tallulah Falls, Ga., where we inspected the gorge abounding in ledges with innumerable webs of Hypochili. The elevation here is only 1,600 feet but the ledges are of the same type as in the vicinity of Highlands. The descent is exceedingly steep and many ledges are practically inaccessible. Tallulah Falls is the southernmost locality which we visited. We now decided to go to the Walden Ridge, which as stated above, is mentioned in Comstock's Spider Book without reference to a more definite locality. We went by way of Frank-

lin, Dillsboro and Bryson City and then through the Nantahala river valley, where we found again numerous *Hypochili* at an elevation of about 2,000 feet. Occasional search of ledges between Topton and Murphy did not reveal the presence of any *Hypochili* and the perfectly bare ground of red clay around Ducktown is quite unsuitable for the life of this spider. We were rather surprised not to see any webs on the ledges along the Kimsey Highway in the Beans Mountains although the conditions seem to be suitable for their existence there.

The Walden Ridge follows the western bank of the Tennessee River by which it is separated in the south from Lookout Mountain. It is much drier than the mountains which we had visited before and is separated from the Beans Mountains by the broad valley of the Tennessee River. As one motors north from Chattanooga to Dayton, one observes numerous ledges close to the top of the ridge. Intending merely to verify the presence of *Hypochilus* in the Walden Ridge, we ascended it only at one place, namely, by the road from Dayton to Morgan Springs. Here we found indeed numerous *Hypochili* at an elevation of 1,600 feet, although the woods and ledges were fairly dry. On one ledge abounding in webs of *Hypochili* we found also a large gravid female *Epeira cavatica* and a mature male *Marpissa californica*, the latter recorded now for the first time from Tennessee.

Whether *Hypochilus* occurs further north on the Walden Ridge we do not know, because we now left it for the Great Smokies by way of Sweetwater, Madisonville, Maryville and Gatlinburg. Twenty-two miles beyond Maryville we encountered numerous specimens on ledges near the road in the Chilhowee Mountains at an elevation of 1,150 feet and webs could be seen from here on along the road to Gatlinburg. Webs were also numerous on the Indian Gap road up to an elevation of 4,500 feet, but none were seen higher up. Our route lay by way of Sevierville and Newport to Hot Springs, Trust and Cross Rock. A little beyond Hot Springs we saw again numerous webs and collected specimens almost as far as Cross Rock, the elevation at one place having been measured as 1,700 feet. Going through Asheville to Spruce Pine and once more stopping for the night at Little Switzerland we started next day on our way to Mountain

Lake in Virginia. As before, we found no *Hypochili* on the road from Little Switzerland to Spruce Pine, but saw and collected three female *Latrodectus geometricus* with cocoons. The first point at which we again encountered webs of *Hypochili* was beyond Linville, about 15 miles from Blowing Rock on ledges by the road at an elevation of 4,100 feet and from here on for about a mile along the Watauga River. This was the last locality at which we saw *Hypochili* and although the road through Boone to Independence and Wytheville crosses the Unaka National Forest and has many ledges, no webs were seen here.

From the data obtained on this collecting trip the main geographical area inhabited by *Hypochilus* may be represented as a triangle with its apex at Blowing Rock, N. C., and its base extending from Maryville, Tenn., to Tallulah Falls, Ga. This area encloses the Great Smokies, the Nantahala Mountains, and the southern half of the Blue Ridge. Lookout Mountain and the Walden Ridge lie considerably to the west of this area and represent probably the westernmost extension in the distribution of *Hypochilus*. A considerable gap lies between this and the eastern area, so far without any indication as to the manner or path by which the invasion of this narrow strip has been accomplished.